ABSTRACT:

Silver-filled asymmetric polyethersulfone (PES) membranes were prepared by a simple phase inversion technique. The effects of polyvinylpyrrolidone (PVP) and 2, 4, 6-triaminopyrimidine (TAP) on the surface properties of the silver-filled asymmetric membrane were investigated for antibacterialapplication. The dispersion of silver nanoparticles (Ag) and silver content on membrane surface were characterized using field emission scanning electron microscope (FESEM) and energy dispersive spectrometer (EDS), respectively. Results showed that smaller silver particles were formed in PES membranes when PVP and TAP were added during dope preparation. Using inductively coupled plasma mass spectrometry (ICP-MS), it is found that silver leaching has been significantly reduced up to 57% and 63% upon the addition of PVP and TAP respectively. The improved silverdispersion on membrane surfaces was able to enhance the antibacterial activity against Escherichia coli (E. coli) and Staphylococcus aureus (S. aureus) as evidenced by larger inhibition ring in agar diffusion method. The filtration of E. coli suspension (optical density = 0.31 at ? = 600 nm) carried out on prepared membranes proved that PES–AgNO3 with TAP as dispersant appeared to inhibit almost 100% bacterial growth in rich medium. Hence, overall results showed the potential of PES–AgNO3 with TAP to be used for antibacterialapplications especially in water treatment.